

AN 2 and 1. N. I. Keld. V. 16  
of the sample before vaporization. The samples were prepd. by (1) ppin; from soln.; (2) soaking the solid basic component in solns. of admixt. elements, and (3) mech. mixing of basic component with solid oxides of admixt. elements. Vaporization was carried out at atm. pressure and *in vacuo* ( $10^{-3}$  mm.) at 800-2000°. At approx. 1800°,  $K$  did not depend on the basic component. The wt. of the sample if it did not exceed 100 mg. had no effect on  $K$ . Once the required temp. was reached 2-2.5 min. sufficed to vaporize all the admixts. from a 50-mg. sample. Generally, the time required was less for vaporization *in vacuo* than at atm. pressure. The concn. of the admixts. in the sample did not affect  $K$ . The presence of extraneous elements, such as Ga and Ag (cf. Scribner and Mullin, C.A. 41, 1871i) had no effect on  $K$ . The distance between the sample and the capsule (electrode) did not affect  $K$ ; however, too short or too long distances should be avoided; 1-2.5 cm. gave the best results. The method of prep. the sample affected the temp. at which complete vaporization of admixts. was obtained, particularly when samples were prepd. by method (1). In this case, admixt. elements entered lattices of the basic component when the at. radii of the two were similar. In such cases complete vaporization was obtained at temps. at which  $T_v/T_m = 0.55-0.6$ , where  $T_v$  is the temp. of vaporization and  $T_m$  is the m.p. of the basic component. This ratio of temps. is analogous to Tamman's "Auflockerung" (cf. C.A. 17, 3434; 19, 2161; 20, 3374; 23, 747).

M. Hensch.  
AM out for 2/2

SOV/81-59-21-73780

Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 21, p 7 (USSR)

AUTHORS: Kaliteyevskiy, N.I., Chayka, M.P.

TITLE: The Ratio of Magnetic and Quadruple Moments of  $U^{233}$ <sup>19</sup> and  $U^{235}$ <sup>19</sup> Nuclei

PERIODICAL: Fiz. sb. L'vovsk. un-t, 1958, Nr 4(9), pp 12 - 14

ABSTRACT: In continuation of the work published earlier (RZhKhim, 1957, Nr 16, 53621) spectroscopic evaluations have been made of the ratio of the magnetic moments of  $U^{232}$  and  $U^{235}$  under the assumption that the spin of both uranium isotopes is equal to  $7/2$ . The ratio of the magnetic moments is equal to  $1.6 \pm 0.1A$  and that of the quadrupole moments to  $0.8 \pm 0.3$ .

S. Shushurin



Card 1/1

KALITEYEVSKIY, N.I. CHAYKA, M.P.

Spectroscopic determination of nuclear moments of  $\text{Cu}^{63}$  and  $\text{Cu}^{65}$ .  
Fiz.sbor. no.4:21-24 '58. (MIRA 12:5)

1. Leningradskiy ordena Lenina gosudarstvennyy universitet  
imeni A.A.Zhdanova.  
(Copper--Isotopes) (Nuclear moments)

ZAYDEL', A.N.; KALITEYEVSKIY, N.I.; LIPIS, L.V.; CHAYKA, M.P.

Spectrum analysis of thorium and beryllium by the vacuum evaporation method. *Fiz.sbor.* no.4:31-32 '58. (MIRA 12:5)

1. *Fizicheskiy institut Leningradskogo ordena Lenina gosudarstvennogo universiteta imeni A.A.Zhdanova.*

(Thorium--Spectra)

(Beryllium--Spectra)

AUTHORS:

Kaliteyevskiy, N. I., Perel', V. I.,  
Chayka, M. P.

SOV/48-22-6-14/28

TITLE:

On the Accuracy of the Determination of Constants of the Hyperfine  
Structure From Optical Measurements (O tochnosti opredeleniya  
konstant sverkhtonkoy struktury iz opticheskikh izmereniy)

PERIODICAL:

Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, 1958, Vol. 22,  
Nr 6, pp. 692-695 (USSR)

ABSTRACT:

In the introduction it is pointed out that this problem has not found the attention it deserves in publications in spite of its great importance which is due to the fact that knowledge of the constants of hyperfine structure makes it possible, without quantum-mechanical calculation to determine important nuclear constants as e.g. the relation of the magnetic- and quadrupole moments of two isotopes of an element. The theories relating to this problem are discussed (Refs 1-8). In this connection it was found that the results obtained for the constants of hyperfine structure obtained by various methods show satisfactory agreement with respect to magnetic nuclear moments, but that, with respect to quadrupole moments these values (B) differ by up to the

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On the Accuracy of the Determination of Constants of  
the Hyperfine Structure From Optical Measurements

SOV/48-22-6-14/28

1.5-fold. Therefore the conclusion is drawn that the accuracy of optical measurements when determining moments of higher order (e.g. octupoles) are unreliable. By way of an example it is mentioned that the value computed in this paper for  $A_3$  for the term  $^2D_{3/2}$  for copper apparently does not represent octupole interaction but must be considered to be caused by systematic errors in measuring the position of sublevels of hyperfine structures. There are 1 table and 9 references, 3 of which are Soviet.

ASSOCIATION: Fizicheskiy institut Leningradskogo gos. universiteta im. A. A. Zhdanova (Institute of Physics, Leningrad State University named A. A. Zhdanov)

1. Materials--Structural analysis
2. Materials--Optical analysis
3. Structural analysis--Effectiveness

Card 2/2

24(7)

AUTHORS:

Kaliteyevskiy, N. I., Chayka, M. P.

SOV/54-59-3-10/21

TITLE:

Photoelectric Measurement of the Relative Intensities of the  
Hyperfine Structural Components With the Problem of Spin  
Determination of the Lu<sup>176</sup> Nucleus

PERIODICAL:

Vestnik Leningradskogo universiteta. Seriya fiziki i khimii,  
1959, Nr 3, pp 51-60 (USSR)

ABSTRACT:

In the present paper the hyperfine structure of Lu<sup>176</sup> is investigated and herefrom the nuclear spin is determined. It was found that for obtaining sufficiently precise data an enrichment of Lu<sup>176</sup> to 30% is necessary. The line Lu II  $\lambda$  6463 Å (<sup>3</sup>P<sub>0</sub>-<sup>3</sup>D<sub>1</sub>) (Fig 1) was measured. The spectrometer (Fig 2) is described ; it consists mainly of a Fabri-Perot interferometer of the type IZS-9. The metallic mirror had multi-layered dielectric coatings produced by T. N. Krylova scientific collaborator of the GOI. A circular stop was used for centering and increasing the light intensity. A diffraction monochromator was used to separate the lines to be investigated. This grating was capable of centering up to 50% of the required line. An additional filter was used

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Photoelectric Measurement of the Relative Intensities of the Hyperfine Structural Components With the Problem of Spin Determination of the  $\text{Lu}^{176}$  Nucleus SOV/54-59-3-10/21

to eliminate superpositions. The light (emerging) from the spectrometer hits a photomultiplier the signals of which were collected by a bridge scheme. The light intensity of the apparatus, as one of the most important elements, was determined. In this connection the contribution of each individual part of the instrument was taken into account. For the excitation of the lines a gas discharge tube was used with a liquid air cathode. From a series of pictures of natural Lu the spin of  $\text{Lu}^{175}$  to  $I = 7/2$  was determined from the relative intensities of the components. The separation of the background and the elimination of superpositions as well as a consideration of the changes of the cathodes was made. Tables 1 and 2 show the relative intensities of the two components and a comparison with the theoretical value. The measured value of  $c/a$  is  $1.31 \pm 0.03$ . The theoretical mean value is found at  $c/a = 1.308 \pm 0.012$ . Herefrom the nuclear spin  $I = 7$  was determined. The next possible values  $I = 6$  and  $I = 8$  are still

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Photoelectric Measurement of the Relative Intensities of the Hyperfine Structural Components With the Problem of Spin Determination of the Lu<sup>176</sup> Nucleus SOV/54-59-3-10/21

within the error limit. These values are in good agreement with the results obtained by Gallagher and Moszkowski (Ref 9) and Peker (Ref 10). In conclusion, the authors thank S. E. Frish for his interest in the work, V. S. Zolotarev for the production of the enriched preparation, G. K. Yeregin for having supplied natural lutecium, and L. K. Peker for the discussion of the results obtained. There are 5 figures, 2 tables, and 11 references, 5 of which are Soviet.

SUBMITTED: April 15, 1959

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24(7), 24(4)

SOV/51-6-6-26/34

AUTHORS: Kalitoyevskiy, N.I., Malyshev, G.M. and Chayka, M.P.

TITLE: A Photoelectric Spectrometer with a Fabry-Perot Interferometer  
(Fotoelektricheskiy spektrometr s interferometrom fabri-pero)

PERIODICAL: Optika i spektroskopiya, 1959, Vol 6, Nr 6, pp 820-822 (USSR)

ABSTRACT: Jacquinet (Ref 1), Chabbal (Ref 2) and Chayka (Ref 3) showed that the speed of a spectrometer with a Fabry-Perot interferometer is much higher than the speed of a similar spectrometer with a diffraction grating. The present paper discusses a photoelectric spectrometer developed at NIFI of the Leningrad State University (Fig 1). High resolving power of the instrument was ensured by a Fabry-Perot interferometer (2 in Fig 1) with dielectric reflecting coatings. 7-layer coatings of  $TiO_2$  and  $SiO_2$  were deposited chemically on this interferometer in T.N. Krylova's laboratory. The interferometer was placed into a hermetically sealed chamber in which the pressure could be varied from several mm Hg to one atmosphere. The uniformity of the scanning rate was ensured by supplying nitrogen from a high-pressure cylinder (~100 atm) through a narrow capillary to the interferometer chamber. Interference rings were focused in the plane of the slit of a diffraction monochromator. A circular diaphragm was used to separate out the required portion of the central interference ring. A diffraction spectrum of the 7th

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A Photoelectric Spectrometer with a Fabry-Perot Interferometer

SOV/51-6-6-26/34

order was used in the green region and the 5th order was used in the red region. High angular dispersion of the instrument made it possible to use wide slits and this ensured high speed of the apparatus. To avoid transposition of the diffraction-spectrum orders another monochromator (3) with a constant deviation angle was used between the source of light (4) and the interferometer (2). The light signal from the diffraction monochromator (8) was recorded by means of the photomultiplier, d.c. amplifier and a recording potentiometer EPP-09. Four types of photomultipliers were used: FEU-17 in the blue and green regions, FEU-12 and FEU-14 in the yellow and red regions and FEU-22 for wavelengths longer than 6600 Å. The apparatus described was used to record the hyperfine structure of lines of certain isotopes of lutecium, gadolinium and holmium. Fig 2 shows the record of the hyperfine structure of the holmium line at 5982 Å. A hollow-cathode discharge tube was used as the source of light. There are 2 figures and 6 references, 4 of which are Soviet and 2 French.

Card 2/2

KALITEYEVSKIY, N.I.; CHAYKA, M.P.

~~Photoelectric measurements of relative intensities of components~~  
of hyperfine structure for the determination of the spin of the  
Lu<sup>176</sup> nucleus. Vest.LGU 14 no.16:51-60 '59. (MIRA 12:10)  
(Lutetium)

21 (1)

AUTHORS:

Kaliteyevskiy, N. I., Chayka, M. P., SOV/56-37-3-57/62  
Pacheva, I. Kh., Fradkin, E. Ye.

TITLE:

Nuclear Moments of the Odd Gadolinium Isotopes

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 3(9), pp 882 - 884 (USSR)

ABSTRACT:

The present "Letter to the Editor" contains an abundance of details partly taken from the authors' own investigations and partly from other publications. In an earlier paper (Ref 1) the hyperfine structure of the 3 lines of Gd I: 5015, 5103, and 5251 Å was investigated by means of a photoelectric spectrometer. The investigations were carried out on the very pure isotopes Gd<sup>155</sup> (97.3%) and Gd<sup>157</sup> (91.4%). Both isotopes have the spin I = 3/2. The magnetic moments:  $\mu_{155} = -0.32 \pm 0.04$ ,  $\mu_{157} = -0.40 \pm 0.04$ . The quadrupole moments:  $Q_{155} = 1.6 \cdot 10^{-24} \text{ cm}^2$ ,  $Q_{157} = 2 \cdot 10^{-24} \text{ cm}^2$ ; these values are nearly double as high as those found by Speck. The internal quadrupole moments  $Q_o^{155} = 8 \cdot 10^{-24} \text{ cm}^2$  and  $Q_o^{157} = 10 \cdot 10^{-24} \text{ cm}^2$  agree as to the order

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## Nuclear Moments of the Odd Gadolinium Isotopes

SOV/56-37-3-57/62

of magnitude with those obtained according to the method of the Coulomb excitation of the gadolinium nuclei. The deformation parameters were found to amount to  $\delta_{155} = 0.31$  and  $\delta_{157} = 0.37$ . With respect to the gyromagnetic ratios  $g_K$  and  $g_R$  (of the internal and collective motions) data, which were obtained from Nilsson's tables, are compared with those obtained by other (Western) authors. Calculations resulted in  $g_K 155 = -0.8$  nuclear magnetons and  $g_K 157 = -0.9$  nuclear magnetons,  $g_R 155 = g_R 157 = 0.7$ . The data concerning the  $g$  and  $\delta$  are finally compared with those obtained by Gauvin. The authors thank V. S. Zolotarev for placing the isotopes at their disposal; and L. K. Peker for his advice and discussions. There are 9 references, 2 of which are Soviet.

ASSOCIATION: Fizicheskiy institut Leningradskogo gosudarstvennogo universiteta (Institute of Physics of Leningrad State University)

SUBMITTED: June 19, 1959

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CHAYKA, M.P.

24(4), 24(7)  
APPENDIX

1907/51-55-1-10/11  
Bogdanov, I. P., Bochkova, O. P., Zaydol', A. P.,  
Zakharov, V. E., Egan, Yu. E., Kaligverdiyev, A. I., Penkin,  
E. P., Tsyglov, B. F., Shukhin, A. E., Lipin, L. V.

TITLE:

Sergey Mikhaylovich Prish (Sergey Mikhaylovich Prish).  
On the occasion of his 80th birthday  
(A scientific celebration on days roundness)

PERIODICAL:

Voprosi fizicheskikh nauk, 1959, Vol. 59, No. 1, pp. 165-167 (1959)

ABSTRACT:

On June 19th, 1959, the well-known Soviet physicist S. E. Prish, who made a name for himself especially in the field of spectroscopic optics, attained the age of sixty. He began his scientific work as a student at the Physico-mathematical Department of Leningrad University (Physico-mathematical Department of Leningrad University). He was a student of the famous physicist, Professor S. I. Zhukovskiy. He continued his work at the Department of Spectroscopy of the Leningrad University. Since 1954 he held a chair for optics and supervised work at the Physics Department, first as dean and later as director of the Nauchno-issledovatel'skiy fizicheskii institut LIO (Scientific Research Institute for Physics at Leningrad State University).

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In 1948 he was appointed Corresponding Member, A. U. S. S. R., and took active part in the work of the Academy of Sciences of the U. S. S. R. He was elected a member of the International Committee for Spectroscopy and chief editor of the journal Optika i Spektroskopiya. He was a member of the International Committee for Spectroscopy at the 1958th General Assembly of the International Union of Pure and Applied Chemistry, the organization of atomic spectra, the IUPAC. He first concentrated his scientific interest on the effect in the medium and potassium spectrum, as well as upon experimental spectroanalytical investigations. In 1950 he started a cycle of works, which was devoted to optical methods of investigation of the properties of the atomic nucleus. (An investigation of the interaction between nucleus and electron shell led to the discovery of the hyperfine structure of spectral lines). He investigated the hyperfine structure of H<sub>2</sub> and H<sub>2</sub> isotopes. He investigated the interaction between nucleus-optical parity. He further investigated the structure of isotopes mixtures, the excitation mechanism of the higher atomic levels, and questions of the interaction of elementary

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particles. Finally, mention is made of his pedagogical activities, especially his courses in physics, which are partly held together with A. V. Zinov'ev. There are 3 figures and 21 Soviet references.

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21(1)  
AUTHORS:

Kaliteyevskiy, N. I., Chayka, M. P.

SOV/20-126-1-14/62

TITLE:

Spectroscopic Determination of the  $\text{Lu}^{176}$  Nuclear Spin  
(Spektroskopicheskoye opredeleniye spina yadra  $\text{Lu}^{176}$ )

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 1, pp 57-58 (USSR)

ABSTRACT:

The spin of the  $\text{Lu}^{176}$  nucleus is determined by the relative intensity of the components of the hyperfine structure of the line  $\text{Lu } 41\lambda 6463 \text{ \AA } (^3P_0 - ^3D_1)$ . The scheme of the structure of this line is shown in figure 1. According to the amount of spin of the  $\text{Lu}^{176}$  nucleus, the ratio of intensities of the two extreme components (c/a) must assume the following values:

I	5	6	7	8
c/a computed	1444	1364	1308	1267

Accurate optical measurements are disturbed by the components of the fine structure of  $\text{Lu}^{175}$ , but by the choice of a suitable Fabry-Perot interferometer, the 3 components of  $\text{Lu}^{175}$  and the

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Spectroscopic Determination of the  $\text{Lu}^{176}$  Nuclear Spin

SOV/20-126-1-14/62

central component of  $\text{Lu}^{176}$  can be put into agreement. The measurements were made by means of a photoelectric spectrometer with an Fabry-Perot interferometer. The spectrum of the lutecium was excited in a gas discharge tube with a hollow cathode cooled by liquid air. To eliminate possible systematic errors, the hyperfine structure of the line of  $\text{Lu}^{175}$  was recorded under the same conditions. The curve of intensity of  $\text{Lu}^{176}$  was then computed by the recorded curve of the hyperfine structure of  $\text{Lu}^{176}$  (which was averaged over 5 orders of interference), and from the curve thus ascertained, the ratio (c/a) of the components of  $\text{Lu}^{176}$  was then computed. After considering the correction for the superimposition of the outlines of the components measured, the value  $1.31 \pm 0.03$  was obtained. These computations delivered the dependence of the values for c/a on the nuclear spin I as indicated in the above table. The ratio c/a measured with  $1.31 \pm 0.03$  is in good agreement with the nuclear spin  $I = 7$ , and also with the presuppositions which are based on the application of Nil'son's scheme (Refs 2, 3). Also according to this scheme, the value  $I=7$  is most probable. The next possible values  $I = 6$  and  $I = 8$  lie beyond the limits of error of the measurements described here. For

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**Spectroscopic Determination of the Lu<sup>176</sup> Nuclear Spin**

SOV/20-126-1-14/62

checking these measurements, only the spectral line Lu  $\lambda$  6463 Å was used because of the small quantities of enriched preparation. Therefore, also measurements of other spectral lines of lutecium are required for a definite rejection of the spin values  $I \neq 7$ . The authors thank S. E. Frish and L. K. Peker for the discussion of the results, as well as V. S. Zolotarev for the supply of the enriched lutecium preparation. The authors also thank G. K. Yeregin for the supply of pure lutecium preparations of natural isotopic composition. There are 2 figures and 3 references, 1 of which is Soviet.

**ASSOCIATION:** Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova  
(Leningrad State University imeni A. A. Zhdanov)

**PRESENTED:** January 22, 1959 by A. A. Lebedev, Academician

**SUBMITTED:** January 13, 1959

Card 3/3

MALYSHEV, G.M.; SHIDAN, V.B.; FRADNIK, E.Ye.; CHAYEN, N.P.

Resolution of a monochromator with photoelectric recording. Opt.  
i spektr. 7 no. 6:780-784 D '59. (MIRA 14:2)  
(Monochromators)

SEMEROV, R.I.; FADKIN, E.Ye.; CHAYKA, M.P.

Apparatus function of a Fabry-Perot spectrometer with a  
rectangular orifice plate. Opt. i spektr. 7 no. 6:785-788  
D '59. (MIRA 14:2)

(Spectrometer)

CHAYKA, M.P.; FRADAIN, E.Ye.

Method for transforming spectral line shapes and its application  
to the measurement of the temperature and other parameters of a  
light source. Opt. i spektr. 7 no. 6:820-823 D '59.

(MIRA 14:2)

(Spectrometer)

PHASE I BOOK EXPLOITATION

SOV/5090

Zaydel', A. N., N. I. Kaliteyevskiy, L. V. Lipis, and M. P. Chayka

Emissionnyy spektral'nyy analiz atomnykh materialov (Emission Spectrum Analysis of Atomic Materials) Leningrad, Fizmatgiz, 1960.  
686 p. 8,000 copies printed.

Ed. (Title page): A. N. Zaydel', Professor; Ed.: Ye. Ya. Shreyder;  
Tech. Ed.: A. A. Zabrodina.

PURPOSE: This book is intended for specialists in optics and spectral analysis.

COVERAGE: The book deals with the techniques of spectral analysis used in the determination of the purity of atomic materials. The work does not discuss determinations of components in alloys, including Nb-U and U-Al used in reactor construction, and in alkali metal alloys, nor does it describe the analysis of atomic raw materials (ores and primary products of their processing) since this type of materials can be treated by conventional

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**Emission Spectrum Analysis (Cont.)**

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spectral analysis methods. Ch. II, III, IX, XII, XIII, and XIV were written by A. N. Zaydel'; Ch. VI, X, and XI by N. I. Kaliteyevskiy; Ch. VII and VIII by L. V. Lipis; Ch. IV by M. P. Chayka; Ch. I by A. N. Zaydel' in cooperation with N. M. Kaliteyevskiy; and Ch. V. by M. P. Chayka and A. N. Zaydel'. The authors thank S. E. Frish, A. A. Petrov, S. M. Rayskiy, M. A. Yel'yashevich, A. A. Bashilov, V. V. Nalimov, and Ye. Ya. Shreyder. References accompany each of the three parts of the books.

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<b>PART I. PRINCIPLES OF SPECTRAL ANALYSIS AND THE APPARATUS</b>	
Ch. 1. Principles of Emission Spectrum Analysis	
1. Basic conditions	17

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24.6700

AUTHORS:

Kaliteyevskiy, F.I., Chayka, M.P., Pacheva, I.Kh. and Fradkin, E.Ye. SOV/51-8-1-3/40

TITLE:

Spectroscopic Determination of Nuclear Moments of Odd Gadolinium Isotopes 19

PERIODICAL:

Optika i spektroskopiya, 1960, Vol. 8, Nr 1, pp 13-22 (USSR)

ABSTRACT:

The authors investigated photoelectrically the hyperfine structure (h.f.s.) of the  $5015.04 \text{ \AA}$  ( $^2\text{G}_9 \rightarrow ^2\text{F}_8$ ),  $5103.45 \text{ \AA}$  ( $^2\text{G}_8 \rightarrow ^2\text{F}_7$ ),  $5251.18 \text{ \AA}$  ( $^2\text{G}_8 \rightarrow ^2\text{F}_8$ ) lines of separated gadolinium isotopes and natural gadolinium. The purpose of the investigation was to determine the quadrupole moments of  $\text{Gd}^{155}$  and  $\text{Gd}^{157}$  and to confirm optically the spin of these nuclei. The authors used a photoelectric spectrometer with a Fabry-Perot interferometer (Refs 7, 8) and a photomultiplier FEU-17 with a good signal-to-noise ratio at low light intensities. The spectrum of gadolinium (used in the form of  $\text{Gd}_2\text{O}_3$ ) was excited in an argon-filled discharge tube with a hollow cathode. In order to minimize the Doppler broadening, the hollow cathode was cooled with liquid air and the discharge current was kept below 30 mA (the line-width rose linearly with current, Fig 1). Under such conditions the line width corresponded to that in a gas at 2500K. Even then it was not possible to resolve all the h.f.s.



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## Spectroscopic Determination of Nuclear Moments of Odd Gadolinium Isotopes

components. Gadolinium samples had compositions shown in Table 1: Nr 1 had 97.3% Gd<sup>155</sup>, Nr 2 had 91.4% Gd<sup>157</sup>, Nr 3 (natural Gd) had 0.2% Gd<sup>152</sup>, 2.86% Gd<sup>154</sup>, 15.61% Gd<sup>155</sup>, 20.59% Gd<sup>156</sup>, 16.42% Gd<sup>157</sup>, 23.45% Gd<sup>158</sup>, 20.87% Gd<sup>160</sup>. Some of the results obtained are given in Figs 2 and 3 and in Table 2. Fig 2 shows the relative positions of the h.f.s. components of Gd<sup>157</sup> and of Gd<sup>160</sup>, Gd<sup>158</sup> and Gd<sup>155</sup> in the case of the 5015 Å line. Fig 3 shows the analysis of the Gd<sup>157</sup> 5015 Å (a) and 5103 Å (b) lines into their h.f.s. component. Table 2 lists the values of the hyperfine separation  $\mathcal{Q}$  (in millikaysers) and of calculated and quadrupole moments  $Q$  (in  $10^{-24} \text{cm}^2$ ). Fig 4 shows the transitions of the three lines investigated in schematic form. The authors found that gadolinium lines can be analysed into their components only if four components are assumed for both Gd<sup>157</sup> and Gd<sup>155</sup>. This means that the spin of both these nuclides is  $I = 3/2$ , in agreement with Low (Ref 5), Manenkov and Prokhorov (Ref 6). Depending on the assumptions made, the authors obtained the following values for the quadrupole moments: either

$$Q_{157} = 1.6 \text{ and } Q_{155} = 1.2 \times 10^{-24} \text{cm}^2,$$

or

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Spectroscopic Determination of Nuclear Moments of Odd Gadolinium Isotopes SOV/51-8-1-3/40

$$Q_{157} = 2 \text{ and } Q_{155} = 1.6 \times 10^{-24} \text{ cm}^2.$$

The magnetic moments were also found:

$$\mu_{157} = -0.40 \pm 0.04 \text{ n.m. and } \mu_{155} = -0.32 \pm 0.04 \text{ n.m.}$$

Consequently the moment ratios were:

$$Q_{155}/Q_{157} = 0.8 \pm 0.1, \mu_{155}/\mu_{157} = 0.79 \pm 0.02.$$

The deformation parameters  $\delta$  of the two nuclides were found to be

$$\delta_{157} = 0.37 \text{ and } \delta_{155} = 0.31, \text{ and their ratio was } \delta_{155}/\delta_{157} = 0.8.$$

The gyromagnetic ratios for the internal ( $g_K$ ) and the collective ( $g_R$ ) motion were also determined. They were  $g_{K157} = -0.9$ ,  $g_{K155} = -0.8$ ,

$g_{R157} = g_{R155} = 0.7$ ;  $g_{K155}/g_{K157} = 0.9 \pm 0.1$ . Acknowledgments are made to V.S. Zolotarev for supplying separated gadolinium isotopes and to L.K. Peker for his advice. There are 4 figures, 2 tables and 21 references, 5 of which are Soviet, 10 English, 4 German, 1 Swiss and 1 Danish.

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SUBMITTED: June 19, 1959

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S/056/60/039/004/008/048  
B004/B070

24.6700

AUTHORS:

Kaliteyevskiy, N. I., Fradkin, E. Ye., Chayka, M. P.

TITLE:

Quadrupole Moments of Odd Barium Isotopes /9

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,  
Vol. 39, No. 4(10), pp. 954-956

TEXT: In order to determine the quadrupole moments of odd barium isotopes, a study of the deviation of the hyperfine structure from the interval rule was made. The structure of  $3P_1$  term of both the lines of Ba I:  $\lambda = 4599.7 \text{ \AA}$  and  $\lambda = 4573.9 \text{ \AA}$  was determined by means of the hyperfine structure of highly enriched separated isotopes Ba<sup>135</sup> (89.3%) and Ba<sup>137</sup> (78.8%). Both the isotopes have spin  $3/2$ . Therefore, the structure of the  $3P_1$  term is characterized by two independent intervals of the hyperfine structure whose magnitudes are related to the constants A and B of the interval function  $W_F = W_J + (1/2)AC + B[C(C+1) - (4/3)I(I+1)J(J+1)]$ ;  $C = F(F+1) - I(I+1) - J(J+1)$ ;  $F = 5/2, 3/2, 1/2$ .

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84390

Quadrupole Moments of Odd Barium  
Isotopes

S/056/60/039/004/008/048  
B004/B070

The experimentally observed values of the intervals and the constants A and B are given in a Table. The quadrupole moments were calculated from the constants:

$Q(\text{Ba}^{135}) = (0.25 \pm 0.12) \cdot 10^{-24} \text{ cm}^2$ ,  $Q(\text{Ba}^{137}) = (0.2 \pm 0.1) \cdot 10^{-24} \text{ cm}^2$ . Since for both the isotopes  $Q > 0$ ,  $\text{Ba}^{135}$  as well as  $\text{Ba}^{137}$  must have a hole in the  $2d_{3/2}$  neutron level. The authors thank V. S. Zolotarev for making available the isotopes, L. K. Peker for discussions, and B. A. Strugach for calculations. There are 1 table and 9 references: 4 Soviet, 2 US, 3 German, and 1 Swedish.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: May 12, 1960

Card 2/2

24.6200 1137, 1138, 1395

S/054/61/000/001/003/008  
B117/B203

AUTHORS: Kaliteyevskiy, N. I., Chayka, M. P., Fradkin, E. Ye.

TITLE: Application of methods of optical spectroscopy to study  
the properties of atomic nuclei

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i  
khimii, no. 1, 1961, 25-33

TEXT: The authors studied the possibility of applying the methods of optical spectroscopy to study the properties of atomic nuclei. When checking these methods, they used, above all, the data found by themselves in 1959-60. The relative intensities of hyperfine structural components were measured with a photoelectric spectrometer with a Fabri-Pérot interferometer (Ref. 2: N. I. Kaliteyevskiy, G. M. Malyshev, M. P. Chayka. Optika i spektroskopiya, VI, 820, 1959). The light intensity of this instrument was higher by at least one order of magnitude than that of a monochromator with diffraction grating of equivalent resolving power. The investigation of only 1 mg of  $\text{Lu}_2\text{O}_3$ , which was

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Application of methods of...

S/054/61/000/001/003/008  
B117/B203

enriched with Lu<sup>176</sup> up to about 30 %, yielded quite clearly a spin value of  $I = 7$ . This investigation proved the importance of the optical method for determining the nuclear spin, as well as its suitability as compared with other methods. The same conclusions were drawn when considering results obtained in the measurement of sublevel ranges of hyperfine structure. With sufficient resolving power of the spectrometer, the reading of components with  $I > J$  gives a unique spin value. If the resolution of components is limited by the Doppler broadening it is generally possible to disintegrate, with sufficient uniqueness, the contour of the line into a certain number of components at a high signal-to-noise ratio. When determining mechanical nuclear moments, the interference method can, of course, not yet be regarded as perfect. The problem as to the accuracy of the method of determining magnetic and quadrupole moments requires a closer investigation, since direct measurement of these moments is impossible. In experimental determinations of hyperfine structural constants, systematic and random errors are unavoidable. Here, the authors deal with the role of random errors. An analysis of experimental data shows that in the investigation of a well resolved structure the measurement of hyperfine structural ranges is well possible at present

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Application of methods of...

S/054/61/000/001/003/008  
B117/B203

with an accuracy of  $\sim 0.5 \cdot 10^{-3} \text{ cm}^{-1}$ . The errors of measurement increase with a worse resolution if it is necessary to disintegrate the contour. Table 3 gives the results of measurement of the hyperfine structure of barium isotopes as an example of such an estimate. All data are given in millikaiser ( $1 \text{ mks} = 10^{-3} \text{ cm}^{-1}$ ). The errors of measurement are shown to be no less than 0.5 %. Approximation methods must be used to calculate absolute values of magnetic moments. For this reason, resonance methods permitting a direct measurement of  $\mu$  are preferable to the optical method. In those cases where direct methods are not applicable, values of magnetic moments may be calculated both by optical and radiospectroscopic measurement with the same accuracy. When determining quadrupole moments, quantum-mechanical approximation methods are indispensable for all methods basing on the interaction of nucleus and electron shell. When estimating the accuracy of such calculations, the authors made the following statement: In single-electron systems, the entire theoretical calculation error is 5-10 % for magnetic moments, and 15-25 % for quadrupole moments. In each individual case, the admixture of many-electron states can be considered, and  $\langle 1/r^3 \rangle$  can be determined from the totality of data. This

Card 3/5

Application of methods of...

S/054/61/000/001/003/008  
B117/B203

increases the accuracy of determination. For many-electron systems, it is difficult at present to make a numerical estimate of calculation errors which may be different for each individual case. In each case where it is difficult to estimate the errors occurring in the calculation of nuclear moments from the hyperfine structure of the term investigated, it would be convenient to study other terms of the respective isotope. Similar values of moments for several terms of varying configuration give a certain security that errors do not become too high. It can be expected to increase the calculation accuracy by complete joint theoretical and experimental investigations of hyperfine and fine structures of atomic spectra, as well as of gyromagnetic atomic relations. The authors thank B. A. Strugach for making a number of computations. A. A. Manenkov, A. M. Prokhorov, and G. Kopferman are mentioned. There are 6 figures, 4 tables, and 18 references: 8 Soviet-bloc and 10 non-Soviet-bloc.

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Application of methods of...

S/054/61/000/001/003/008  
B1.17/B203

Legend to Table 3: Results of measurement of the hyperfine structure of odd barium isotopes. (a) Ranges and constants of hyperfine structure; (b) isotopes.

Интервалы и константы СТС	Изотопы	
	Ba <sup>135</sup>	Ba <sup>137</sup>
5/2 → 3/2	83,6 ± 0,6	93,1 ± 0,4
5/2 → 1/2	137,4 ± 0,7	151,5 ± 0,7
A	34,0 ± 0,2	37,7 ± 0,2
B	-1,2 ± 0,6	-0,9 ± 0,5

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S/051/61/010/001/003/017  
E201/E491

// 4130

AUTHORS: Zaydel', A.N., Razumovskiy, A.N. and Chayka, M.P.

TITLE: A Spectroscopic Analysis of the Isotopic Composition of Lithium

PERIODICAL: Optika i spektroskopiya, 1961, Vol.10, No.1, pp.15-18

TEXT: The authors describe a spectroscopic method for analysis of the isotopic composition of lithium, based on measurements of the component intensities of a resonance doublet at 6707.8 Å. A hollow-cathode discharge tube was used as the light source. It is shown schematically in Fig.1. The isotopic structure was recorded using a Fabry-Perot interferometer. To separate out the required line, a diffraction-grating monochromator was employed. The optical part of the apparatus is shown in Fig.2, where 1 and 5 are slits, 2, 4, 6 and 9 are objectives, 3 is a diffraction grating, 7 is a Fabry-Perot interferometer enclosed in a chamber 8, 10 is an iris diaphragm, 11 is a receiver (a photomultiplier ~~83Y~~-22 (FEU-22) ). The pressure in the chamber 8 was varied periodically, using an automatic

✓c

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S/051/61/010/001/003/017  
E201/E491

# A Spectroscopic Analysis of the Isotopic Composition of Lithium

control device (Fig.3). The signal from the photomultiplier was passed to a d.c. amplifier and then to an automatic recorder **Эпп-09** (EPP-09). An example of the records obtained is given in Fig.4 for a sample containing 2%  $\text{Li}^6$ . Neglecting self-absorption and other effects, the concentrations were calculated from

$$\frac{C_{\text{Li}6}}{C_{\text{Li}7}} = \frac{I_b}{I_a} - \frac{1}{2}$$

where  $I_b$ ,  $I_a$  are the intensities of the components of the 6707.8 Å line shown in Fig.5. A calibration curve used in calculations is given in Fig.6. The sensitivity of the method described here was 0.5%  $\text{Li}^6$ . The errors were represented by a coefficient of variation of 0.15 to 0.7% for  $\text{Li}^6$  contents from 40 to 90%. The time required for each analysis was 10 to 15 min and the minimum amount of lithium was 5 to 10 µg (0.05 mg  $\text{LiCl}$ ).

Card 2/3

S/051/61/010/001/003/017  
E201/E491

**A Spectroscopic Analysis of the Isotopic Composition of Lithium**

Acknowledgments are made to T.N.Krylova for preparation of the interferometer plates and G.M.Malyshov for help in some stages of this work. The work was carried out in 1956-7. There are 6 figures and 10 references: 4 Soviet and 6 non-Soviet (one of which is translated into Russian).

SUBMITTED: January 21, 1960 (to the Editor of "Atomnaya Energiya")  
April 16, 1960 ( to the Editor of "Optika i  
Spektroskopiya")

Card 3/3

TURKIN, Yu.I.; CHAYKA, M.P.

Anomalous ratio of the intensities of the hyperfine structure  
components of indium lines. Opt, i spektr, 11 no.5:695.  
N '61.

(Indium—Spectra)

S/048/61/025/001/020/031  
B029/B060

24.6700

AUTHORS: Kaliteyevskiy, N. I., Chayka, M. P., Pacheva, I. Kh.,  
Fradkin, E. Ye.

TITLE: Nuclear moments of odd isotopes of gadolinium

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 25,  
no. 1, 1961, 111-114

TEXT: This is a report of studies which have been described in a previous preliminary communication. Several data have now been better defined by additional measurements and by improving the calculation method. The authors used a photoelectric spectrometer and a Fabry - Perot spectrometer to study the hyperfine structure of the three lines of GdI:

$\lambda = 5015 \text{ \AA} (z^{11}\text{G}_9 - a^{11}\text{F}_8)$ ;  $\lambda = 5103 \text{ \AA} (z^{11}\text{G}_8 - a^{11}\text{F}_7)$  and

$\lambda = 4743 \text{ \AA} (y^{11}\text{F}_3 - a^{11}\text{F}_4)$ . The measurements were made on separated isotopes of gadolinium with a high-purity degree ( $\text{Gd}^{155} - 97.3\%$ ,

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89254

Nuclear moments of odd isotopes of...

S/048/61/025/001/020/031  
B029/B060

Gd<sup>157</sup> - 91.4%). The components of the fine structure of gadolinium lines are so close to one another (15 to 20 mK) that the fine structure under the given experimental conditions could not be resolved. It can be resolved only if one presupposes four sublevels of the hyperfine structure of the investigated energy levels of Gd<sup>157</sup> and Gd<sup>155</sup>. This unequivocally yields for both isotopes the spin 3/2. The position of the components of the hyperfine structure was determined on the basis of the splitting of the line structure taking account of all superimposing isotopes belonging to other elements. The calculations were carried out for the four intensive diagonal components of the line investigated. The three independent intervals  $\sigma(1-2)$ ,  $\sigma(1-3)$ ,  $\sigma(1-4)$  were experimentally determined for every line of the two isotopes. The ratio of the magnetic moments of Gd<sup>155</sup> and Gd<sup>157</sup> was established by the direct combination of the experimental data:

$$\frac{\mu_{155}}{\mu_{157}} = \frac{\sigma_{155}(1-2) - \sigma_{155}(1-3) + \sigma_{155}(1-4)}{\sigma_{157}(1-2) - \sigma_{157}(1-3) + \sigma_{157}(1-4)} .$$

The ratio of the quadrupole

moments of Gd<sup>155</sup> and Gd<sup>157</sup> can be calculated with a good accuracy by

Card 2/6

Nuclear moments of odd isotopes of...

S/048/61/025/001/020/031  
B029/B060

Casimir's formula. The results of calculations carried out by two different methods are given in Table 1. The value of the ratio of magnetic moments thus found is in good agreement with more recent and more accurate measurements of this quantity by the method of the paramagnetic resonance. The value  $Q_{155}/Q_{157} = 0.8 \pm 0.1$  found by the authors contradicts, however, the spectroscopic measurements by O. R. Speck, who found  $Q_{155} > Q_{157}$ . Therefore, it is of interest to compare the data found by the authors with results obtained by other methods. The most accurate method is evidently that by V. Ramsak et al. (Ref. 10). Like the authors of the present article, those authors also found  $Q_{155} < Q_{157}$  but a difference appears in the qualitative evaluation of  $Q_{155}/Q_{157}$ . For the calculation of the absolute values of the magnetic moment and the quadrupole moment from spectrometric measurements it is necessary to estimate the matrix elements  $\langle H(0) \rangle$  and

$\left\langle \frac{\partial^2 u}{\partial z^2}(0) \right\rangle_J$ , which is, however, possible only by approximation. The

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89254

Nuclear moments of odd isotopes of...

S/048/61/025/001/020/031  
B029/B060

authors found  $Q_{155} = 1.45 \cdot 10^{-24} \text{ cm}^2$  and  $Q_{157} = 1.8 \cdot 10^{-24} \text{ cm}^2$ . The deformation parameters were then estimated from the values of the intrinsic quadrupole moments:  $\delta_{155} = 0.27$  and  $\delta_{157} = 0.33$ . Finally, for the gyromagnetic ratio the authors found  $g_K 155/g_K 157 = 0.9$ , which is in good agreement with experimental data published by other authors. V. S. Zolotarev is thanked for having supplied the pure isotopes and L. K. Peker for his discussions. The article under consideration is the reproduction of a lecture delivered at the 10th All-Union Conference on Nuclear Spectroscopy, which took place in Moscow from January 19 to 27, 1960. There are 1 figure, 2 tables, and 12 references: 5 Soviet-bloc and 6 non-Soviet-bloc.

ASSOCIATION: Nauchno-issledovatel'skiy fizicheskiy institut  
Leningradskogo gos. universiteta im. A. A. Zhdanova  
(Scientific Research Institute of Physics of Leningrad  
State University imeni A. A. Zhdanov)

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Nuclear moments of odd isotopes of...

S/048/61/025/001/020/031  
B029/B060

Legend to Table 1: Ratios of magnetic and quadrupole moments of odd gadolinium isotopes

ratio	$\lambda = 5015 \text{ A}$	$\lambda = 5103 \text{ A}$	$\lambda = 4743 \text{ A}$	mean value
$\mu_{155}$	$0.80 \pm 0.02$	$0.77 \pm 0.01$	$0.79 \pm 0.02$	$0.78 \pm 0.03$
$\mu_{157}$				
$Q_{155}$ 1st method	$0.76 \pm 0.04$	$0.82 \pm 0.02$	$0.88 \pm 0.05$	$0.8 \pm 0.1$
$Q_{157}$ 2nd method	$0.76 \pm 0.03$	$0.82 \pm 0.05$	$0.86 \pm 0.07$	$0.8 \pm 0.1$

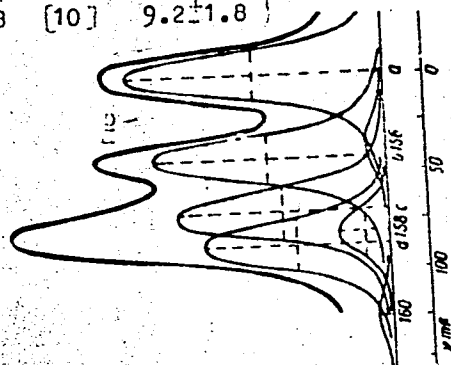
Card 5/6

S/048/61/025/001/020/031  
B029/B060

Nuclear moments of odd isotopes of...

Refer to Table 2: Values of intrinsic quadrupole moments  $Q_0$  and ratios  $Q_{0155}/Q_{0157}$  found by the method of Coulomb excitation.

$Q_{0155}$	$Q_{0157}$	$\frac{Q_{0155}}{Q_{0157}}$	Ref.	$Q_{0155}$	$Q_{0157}$	$\frac{Q_{0155}}{Q_{0157}}$	Ref.
6.8	6.2	1.1	[8]	$6.7 \pm 2.4$		0.76	
7.6	8.1	0.94	[9]		$8.8 \pm 1.8$		
6.5	6.6	0.98	[10]	$9.2 \pm 1.8$		1.04	[11]



Card 6/6

S/051/62/012/003/002/016  
E032/E314

AUTHORS: Razumovskiy, A.N. and Chayka, M.P.

TITLE: Measurement of the isotopic shifts on the  
resonance line of barium

PERIODICAL: Optika i spektroskopiya, v. 12, no. 3, 1962,  
338 - 343

TEXT: The authors report measurements of the isotopic shift  
of  $\lambda$  5535.6 Å BaI ( $6s^2 1S_0 - 6sp^1 P_1$ ), using highly-enriched  
separated isotopes. Instead of the usual photographic method,  
the hyperfine structure was recorded photo-electrically. The main  
object of the present paper is to describe the experimental  
methods employed to reduce random and systematic errors. The  
photo-electric recording of the barium line was carried out with  
the aid of the method described in an earlier paper (Ref. 5 -  
Kaliteyevskiy, N.I., Malyshev, G.M. and Chayka, M.P. - Opt. i  
spektr., 6, 820, 1959). A Fabry-Perot etalon with a separation  
of 7 cm and reflection coefficient of the order of 93% was  
employed. An invar separator was used to reduce the temperature

Card 1/2

Measurement of the ....

S/051/62/012/003/002/016  
E032/E314

effect. An analysis is given of the effect of temperature and pressure changes on the position of the recorded maxima. Devices are described whereby these changes may be compensated in practice. The measured isotopic shifts are as follows:  
 $0(\text{Ba}^{138})$ ,  $+5.7(\text{Ba}^{137})$ ,  $+4.2(\text{Ba}^{136})$ ,  $+7.6(\text{Ba}^{135})$  and  $+4.7(\text{Ba}^{134})$ .  
 The corresponding results reported by J.E. Mack (Phys.Rev., 109, 820, 1958, - Ref. 4) are said to have been 0, +4.7, +3, +6.7 and +5, respectively. The present results are said to be more reliable because enriched specimens were used and all the systematic errors were excluded. Acknowledgments are expressed to N.I. Kaliteyevskiy and E.Ye. Fradkin who took part in this work. There are 5 figures and 4 tables.

SUBMITTED: : March 11, 1961

Card 2/2

36501

S/051/62/012/003/012/016  
E202/E435

24.3200  
6.3600  
AUTHORS: Kagan, Yu.M., Perel', V.I., Chayka, M.P.

TITLE: Theory of optical signal amplification using a medium with negative absorption

PERIODICAL: Optika i spektroskopiya, v.12, no.3, 1962, 427-433

TEXT: Problems of amplifying an optical signal by means of negative absorption medium are discussed but without references to the generation. Formulae for the integral amplification of the incident signal  $A$ , are derived for the Lorentz and Doppler profiles, the integrals being evaluated by means of Bessel's function and power series respectively. In the case of high amplification, i.e.  $k_0 l \gg 1$ , these are

$$A_{\text{Lor}} = \frac{e^{k_0 l}}{\sqrt{\pi k_0 l}} ;$$

$$A_{\text{Dopp}} = \frac{e^{k_0 l}}{\sqrt{k_0 l}}$$

where  $k_0$  is the amplification coefficient at the centre of the line and  $l$  is the thickness of the medium. These considerations are applied to a parallel mirror containing the active medium  
Card 1/2

Theory of optical signal ...

S/051/62/012/003/012/016  
E202/E435

within and a uniform medium outside the mirrors. Relations are developed for the ratio of incident  $\mathcal{I}_0$ , and emergent  $\mathcal{I}$ , intensities of the beam, which in the case of ideal mirror and narrow beam are

$$\frac{\mathcal{I}}{\mathcal{I}_0} = \frac{(1 - r)^2 e^{kl}}{1 - r^2 e^{2kl}}$$

The ideal case is developed further to account for real finite mirrors with surface defects. The effects of the edges on the width of the diffraction rings and the departures from optical flatness are considered and a working example based on experimentation of A.Javan and associates (Ref.6: Phys. Rev., Letters, 6, 1961, 106) are given. The work is completed by considering frequency distribution in the amplified beam in the absence of interference for the Doppler and Lorentz profiles. There are 3 figures.

SUBMITTED: July 24, 1961

Card 2/2

38531

S/051/62/012/006/019/020  
E036/E418

24.2500

9,2576

AUTHORS: Fradkin, E.Ye., Chayka, M.P.

TITLE: Continuous radiation of a three level quantum generator with an optical pump

PERIODICAL: Optika i spektroskopiya, v.12, no.6, 1962, 796-798

TEXT: T.H.Maiman (Phys. Rev., v.123, 1961, 1145) has solved the steady state equations for a three level quantum generator by using a linear approximation. In the present paper exact solutions are presented, thus taking into account the dependence of the populations  $N_2$  and  $N_1$  of the levels 1 and 2 (Fig.1) on the probability of induced transitions. Expressions are obtained for the difference in population ( $N_2 - N_1$ ) of the two levels and for the radiation power as a function of the pump radiation flux density  $F$ . Curves are plotted using data from T.H.Maiman's papers (Phys.Rev., Letters, v.4, 1960, 564; Phys. Rev., v.123, 1961, 1151) on the ruby laser. It is shown that with increasing pump power the radiation power goes to a limiting value. Also as  $F \rightarrow \infty$ ,  $(N_2 - N_1)/N_0$  goes to the limit  $Q_M^0/Q_C$  where  $N_0$  is the total number of atoms and  $Q_M^0/Q_C$

Card 1/2



Continuous radiation ...

S/051/62/012/006/019/020  
E036/E418

are the "Q's" of the material with all the atoms in the ground state and of the cavity respectively. This is stated to be equivalent to the usual condition for generation in the linear approximation. It is concluded that saturation through  $(N_2 - N_1)$  is achieved at small pump powers significantly sooner than saturation by generated power and the limiting condition for  $(N_2 - N_1)$  is fulfilled over the whole range of generation. There are 2 figures.

SUBMITTED: January 17, 1962

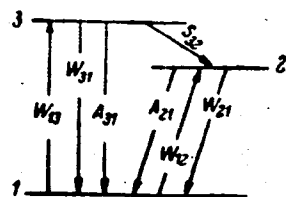
Fig.1. The three level diagram.

$W_{12}$ ,  $W_{13}$ ,  $W_{21}$ ,  $W_{31}$  - induced transition probabilities.

$S_{32}$  - transition probability for non-radiative transitions.

$A_{21}$ ,  $A_{31}$  - transition probabilities for spontaneous transitions.

Card 2/2



MARKOVA, G. V.; KALITEYEVSKIY, N. I.; CHAYKA, M. P.

"Observation du Croisement des Sous-Niveaux Zeeman dans le Natrium."

report submitted to 11th Intl Spectroscopy Colloq, Belgrade, 30 Sep-4 Oct 63.

Physics Inst, Leningrad Univ.

CHAYKA, M.P.

Measuring the reflection coefficients of light-dividing layers.  
Opt. i spektr. 14 no.1:159-161 Ja '63. (MIRA 16:5)  
(Reflection (Optics))

CHAYKA, M.P.; YAKOBSON, N.N.

Filter for optical pumping on cesium. Opt. i spektr. 16 no.5:  
899-901 My '64. (MIRA 17:9)

ACCESSION NR: AP4035482

S/0051/64/016/005/0899/0901

AUTHOR: Chayka, M.P.; Yakobson, N.N.

TITLE: Filter for optical pumping of cesium vapor

SOURCE: Optika i spektroskopiya, v.16, no.5, 1964, 899-901

TOPIC TAGS: gas laser, laser pumping method, optical filter, cesium

ABSTRACT: For effective optical pumping to one of the hyperfine sublevels of the ground state of alkali metal vapors one must use light in which the intensity of the hyperfine components does correspond to the intensity rule. In the present paper there is proposed an appropriate selective filter based on a Fabry-Perot interferometer. This is diagramed in the figure (Enclosure 01). The present filter was designed specifically for pumping to one of the hyperfine sublevels of the ground state of cesium, but the parameters can obviously be modified for other pumping purposes. The Fabry-Perot interferometer consists of a fused quartz plate with a multilayer, dielectric reflecting coating on both sides (reflection coefficient about 67%). "The coatings were applied in the laboratory of T.N.Krilova." The lens 2 focuses the light on the ring diaphragm. This consists of a series of alternating

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ACCESSION NR: AP4035482

transparent and opaque rings (the glass plate is first coated with silver and then with black varnish and the double coating is removed with a brass cutter to form the transparent rings). The number of rings that can be used is limited: at a distance of 10 orders from the center the line shifts by half an order relative to the next and the selectivity is impaired. The filter assembly must be maintained at constant temperature. Alignment of the diaphragm, however, is easy. Estimates of the efficiency of the given filter indicate that about 9% of the useful light is stopped by the filter and about 9% of the unwanted light is transmitted. The various advantages of the filter are discussed. Orig.art.has: 5 formulas and 1 figure.

ASSOCIATION: none

SUBMITTED: 05Jun63

SUB CODE: OP, EC

DATE ACQ: 22May64

NR REF SOV: 000

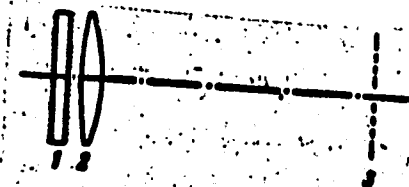
ENCL: 01

OTHER: 009

Card 2/3

ACCESSION NR: AP4035482

ENCLOSURE: 01



Interferometric filter: 1) Fabry-Perot plate,  
2) lens, 3) ring diaphragm.

Card 3/3

L 2138-65 EWT(1) SSD/ASD(a)-5/ASD(a)/ASD(m)-3/AFWL/AFETR/AS(mp)-2/  
ESD(c)/ESD(gs)/ESD(t)/RAEM(t)  
ACCESSION NR: AP4044840 S/0051/64/017/003/0319/0326

AUTHORS: Markova, G. V.; Chayka, M. P.

TITLE: Observation of the crossing of magnetic sublevels of the  
excited states of cesium and sodium

SOURCE: Optika i spektroskopiya, v. 17, no. 3, 1964, 319-326

TOPIC TAGS: cesium, sodium, polarization, resonant emission, in-  
terference effect, level crossing, Zeeman effect

ABSTRACT: The polarization of resonant emission of the sodium line  
5,890 Å ( $3^2P_{3/2} \rightarrow 2^2S_{1/2}$ ) and the cesium line 4,555 Å ( $7^2P_{3/2} \rightarrow$   
 $6^2S_{1/2}$ ) was investigated in fields from zero to 40 Oe. The experi-  
mental set-up was built around a cell containing the vapor of the  
alkali metal, placed in a constant magnetic field, and exposed to  
polarized light from a lamp excited by a high-frequency generator

Card 1/3



L 2136-65

ACCESSION NR: AP4044840

2

and containing the same vapor. The observation was carried out along the field, so as to make the observed polarization to be caused only by interference phenomena. In addition to the maximum at  $H = 0$  (the Hanle effect) additional polarization maxima were observed, due to the crossing of the Zeeman sublevels in the external magnetic field. The experimental values of the polarization (19.6 and 16% for sodium and cesium, respectively) agree well with the theoretical values (19.8 and 15.6%). Results yielded for the lifetime of the  $3^2P_{3/2}$  of sodium a value of  $1.63 \pm 0.05 \times 10^{-8}$  sec, which agrees well with other measurements. "The authors thank S. E. Frish and N. I. Kali-teyevskiy for a discussion of the present article." Orig. art. has: 5 figures and 3 formulas.

ASSOCIATION: None

SUBMITTED: 14Jan64

ENCL: 01

SUB CODE: OP

NR REF SOV: 006

OTHER: 011

Cord 2/3

L 2136-65  
ACCESSION NR: AP4044840

ENCLOSURE: 01

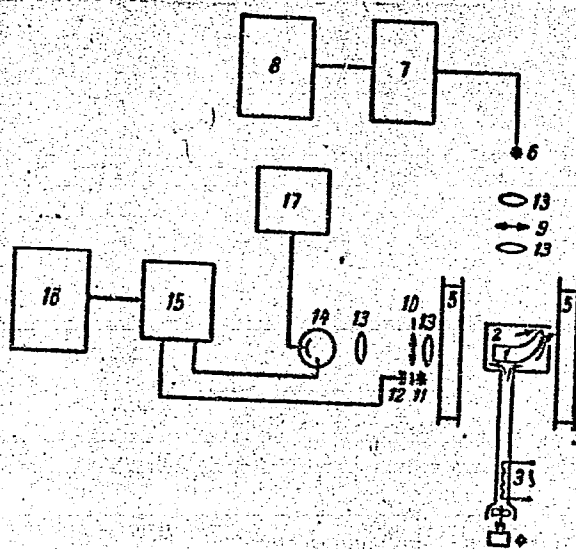


Fig. 1. Block diagram of set-up

- 1 - cell with sodium or cesium vapor,
- 2 - heating cell, 3 - electric oven,
- 4 - fan, 5 - Helmholtz coils, 6 -
- illuminating lamp (sodium or cesium),
- 7 - hf generator for lamp supply,
- 8 - universal power supply, 9 -
- stationary polaroid filter, 10 -
- rotating polaroid with filter, 11 -
- incandescent lamp, 12 - photoresist-
- ance, 13 - objectives, 14 - light
- receiver (photomultiplier), 15 -
- synchronous detector, 16 - automatic
- recorder (EPP-09), 17 - high-voltage
- stabilizer (VS-9)

Cord 3/3

L 20181-65 ENG(j)/EWA(k)/FBD/EWT(l)/EWT(m)/EPF(c)/EEC(k)-2/EEC(t)/T/ENP(t)/  
 EEC(b)-2/ENP(k)/ENP(b)/EWA(m)-2/EWA(h) Pn-h/Po-h/Pf-h/Fr-h/Peb/Pi-h/Pl-h  
 SSD(c)/SSD/AFWL/ASI(n)-5/ASM(p)-2/RAEM(a)/ESD(ga)/ESD(t)/IJP(c) WG/JD  
 ACCESSION NR: AP4041833 S/0054/64/000/002/0040/0046

AUTHOR: Kaliteyevskiy, N. I. Razumovskiy, A. N.; Chayka, M. P.; Cherenkovskiy, V. A.

TITLE: Experiments with gaseous lasers

SOURCE: Leningrad. Universitet. Vestnik. Seriya fiziki i khimii, no. 10, 1964, 40-46

TOPIC TAGS: gaseous laser, continuous gaseous laser, laser beam structure, helium neon laser, stimulated emission

ABSTRACT: The authors have experimented with a continuous gas laser (Ne:He=1:7) working on a wavelength of  $1.15 \mu$  which corresponds to the  $2s-2p$  transition in neon. The study consisted of an investigation of: 1) the intensity of the generated power (stimulated radiation) as a function of the input power, the diameter of the discharge tube, and of gas pressure; 2) the contribution to radiation of the various parts of the discharge; and 3) the structure of the generated beam. It was confirmed in the author's experiments that the intensity of the generated beam reaches a maximum with increase of the input power, and then decreases. In addition to the  $1.15 \mu$  line, the  $1.16 \mu$  line (much weaker than  $1.15$ ) was also

Card 1/2

L.20481-65

0

ACCESSION NR: AP4041833

observed with a diffraction grating. It disappears at very high input. The photograph of the beam shows a ring regardless of the adjustment of the lens. This is explained by the coherence of the stimulated radiation. Orig. art. has: 8 figures.

ASSOCIATION: None

SUBMITTED: 17Jan64

ENCL: 00

SUB CODE: EC

NO REF SOV: 003

OTHER: 001

Card 2/2

L 64006-55 EWA(k)/FBD/ENT(1)/EEC(k)-2/T/EEC(b)-2/ENP(k)/ENA(m)-2/ENA(n)		SCTB/IJP(c)
ACCESSION NR: AP5019760	UR/0051/65/019/002/0255/0263	WG
	621.375.9:53	42
AUTHOR: Zeyger, S. G. <sup>44</sup> ; Kaliteyevskiy, N. I. <sup>44</sup> ; Fradkin, E. Ye. <sup>44</sup> ; Chayka, M. P. <sup>44</sup>		
TITLE: The structure of the radiation field of a gas laser with spherical mirrors		
SOURCE: Optika i spektroskopiya, v. 19, no. 2, 1965, 255-263		
TOPIC TAGS: laser output, gas laser, spherical mirror laser		
ABSTRACT: The intensity distribution of a gas laser with spherical mirrors with a high coefficient of reflection was studied experimentally and theoretically. The dependence of the size of the laser beam on the distance from the resonator center and/or the focusing lens was plotted. The amount of emitted energy which can be focused into a given angle by means of two simple lenses was found to be higher than can be achieved with equal distribution of the intensity of the front of the beam. Orig. art. has: 6 figures and 21 formulas. [YK]		
ASSOCIATION: none		
SUBMITTED: 19Sep64	ENCL: 00	SUB CODE: EC
NO REF SOV: 002	OTHER: 002	ATD PRESS: 4057
Card 1/1 0001		

L 5426-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JG  
ACCESSION NR: AP5019771

AUTHOR: Kallas, Kh.; Markova, G.; Khvostenko, G.; Chayka, M.  
TITLE: Determination of the hyperfine structure constants of cesium from the crossing of magnetic sublevels

UR/0051/65/019/002/0303/0306  
539.184.26 : 546.36  
56  
B

SOURCE: Optika i spektroskopiya, v. 19, no. 2, 1965, 303-306  
TOPIC TAGS: cesium, hyperfine structure, spectral line, spectral energy distribution, Zeeman effect

ABSTRACT: This is a continuation of earlier work (Opt. i spektr. v. 17, 319, 1964) and is devoted to a more precise measurement of the magnetic fields for the crossing of the Zeeman sublevels of the  $7^3P_{1/2}$  state in cesium, and to similar measurements for the  $6^2P_{3/2}$  level. The magnetic field was produced by a pair of Helmholtz coils with constant  $C = 17.77 \pm 0.01$  Oe/amp, the coil axes being directed along the horizontal component of the earth's magnetic field. The vertical component was offset by supplementary coils. Three level crossings each were observed for  $7^3P_{1/2}$  and for  $6^2P_{3/2}$ . Expansion coefficients for the three level-crossing fields are calculated and tabulated. They agree with the published data for both  $7^3P_{1/2}$  and  $6^2P_{3/2}$ . Orig. art. has: 9 formulas and 1 table.

Card 1/2

L 5426-66

ACCESSION NR: AP5019771

ASSOCIATION: none

SUBMITTED: 12Feb65

NR REF SOV: 002

ENCL: 00

OTHER: 001

SUB CODE: OP

*Chh*  
Card 2/2

L 11935-66 EWT(m)/EWP(t)/EWP(b) IJP(g) JD/JG  
 ACC NR: AP6001653 SOURCE CODE: UR/0051/65/019/006/0968/0972

AUTHOR: Al'tman, B.L.; Chayka, M.P.

ORG: None

TITLE: Determining the lifetime of the excited state of cesium  $7^2P_{3/2}$  from double resonance experiments

SOURCE: Optika i spektroskopiya, v. 19, no. 6, 1965, 968-972

TOPIC TAGS: cesium, magnetic resonance, magnetic field, excited state

ABSTRACT: The superfine structure of the  $7^2P_{3/2}$  level of cesium is briefly described and it is shown that in weak magnetic fields each of the four component sublevels is fragmented into Zeeman sublevels with its own Lande factor  $g_F$ . An explanation is given of the double resonance method proposed by A. Kastler and J. Brossel (C.R. Acad. Sci., 229, 1213, 1949). The double resonance signal is proportional, first of all, to the difference of populations. Most favorable was found to be a population by light having a polarization parallel to the magnetic field. The advantages of radiation by light with  $\pi$ -polarization are discussed, and the dependence of the double resonance signal amplitude on the magnetic field is analyzed. It is shown that resonances belonging to different superfine levels lie very close to each other, so that their experimental resolution is an almost hopeless task. Since the signal from the  $F = 5$

Card 1/2

UDC: 539.143.43:535.53:546.36



L 11935-66

ACC NR: AP6001653

level is far greater than the others, the authors assumed that the experimentally observed signal is caused only by transitions between magnetic sublevels of the superfine state with  $F = 5$ . The experimental setup employed for the observation of the double resonance signal is described. A resonance cell with cesium vapors was located in a constant magnetic field and illuminated by polarized light from a lamp containing the same vapors. The lifetime of the excited state of the cesium  $7^2P_{3/2}$  was measured by the width of the magnetic resonance lines:  $\approx (2.5 \pm 0.6) \cdot 10^{-7}$  sec. The Lande factor, estimated according to the resonance transition frequency, was  $g_F = 0.45 \pm 0.05$ . It was also found that the position of resonance is determined by the particular magnetic field in which the distance between the Zeeman sub-levels is equal to the HF field frequency. The width of the magnetic resonance lines between the excited states, moreover, is a function primarily of the width of the levels. A formula expressing this function is presented. The magnetic resonance lines were found to expand under the effect of the HF field and nonuniformities in the permanent magnetic field. A table is given for a comparative study of lifetime calculations made by different authors using different methods. Authors thank A. N. Razumovskiy for adjusting the magnet, R. I. Semenov for assisting in the work, and N. I. Kaliteyevskiy for discussing the results. Orig. art. has: 1 table and 5 figures.

SUB CODE: 20 / SUBM DATE: 20Jul64 / ORIG REF: 005 / OTH REF: 009

Card 2/2

L 41096-66 EWT(1)/ERG(k)-2/FBD/ENF(k)/T IJE(c) WD  
ACC NRI AF6026983 SOURCE CODE: UR/0051/66/021/002/0258/0260

AUTHOR: Kalitayevskiy, N. I.; Popov, M. M.; Rymarchuk, Yu. A.; Tolchinskaya, T. B.; Chayka, M. P.

ORG: none

TITLE: Gas laser generation power in nearly confocal resonators

SOURCE: Optika i spektroskopiya, v. 21, no. 2; 1966, 258-260

TOPIC TAGS: gas laser, neon helium laser, infrared laser, LASER ENERGY, NEON, HELIUM

ABSTRACT: A qualitative explanation of the mechanism responsible for the appearance of the maximum of power generation in a nearly confocal resonator of a gas laser is offered. The generation of a neon-helium laser at  $\lambda = 0.63$  and  $1.15 \mu$  was studied. It is shown that because of a decrease in the figure of merit in the region of instability of the generation, a minimum should appear on the curve representing the generation power as a function of  $L$  ( $L$  being the distance between the mirrors). The width of the minimum is equal to the width of the instability region traversed, and is determined by the difference in the mirror radii  $\Delta R$ . In a study of a resonator with mirrors whose radii  $R_1 = R_2 = 250$  cm within 0.4 cm, minima were obtained whose width was greater than 0.4 cm and was varied by shifting the discharge tube along the resonator axis and replacing the tube by another. These experimental data were attributed to the distorting influence of the exit windows of the discharge tube. It is shown

Card 1/2

UDC: 621.375.9:535 (206.3)

L 41096-66

ACC NR: AP6026983

2

that a tube window built with an error of  $\sim \frac{\lambda}{2}$  and consisting of a lens with a focal length of 100 m causes the appearance of a region of instability of width  $\Delta L = 6$  cm at  $R = 250$  cm. The region of instability was found in similar fashion for a resonator where the space between one of the mirrors and the window is filled with a gas with refractive index  $N_r$  different from the refractive index of air,  $N_a$ . In this case,  $L = \frac{N_r - N_a}{N_r} R$ . These calculations were confirmed in a series of experiments. Authors are grateful to E. Ye. Fradkin for his discussion and to A. N. Razumovskiy for his assistance in the experiment. Orig. art. has: 2 figures and 1 formula. [27]

SUB CODE: 20/ SUBM DATE: 14Mar66/ ORIG REF: 005/ OTH REF: 002/ ATD PRESS:

5057

Card 2/2 hs

VECHER, A.S.; CHAYKA, M.T.

Photosynthetic activity of the green potato tubers. Dokl. AN  
BSSR 6 no.5:331-333 My '62. (MIRA 15:6)

1. Institut biologii AN BSSR.  
(Photosynthesis)  
(Potatoes)

VECHER, A.S. [Vechar, A.S.]; MAS'KO, A.A.; CHAYKA, M.T.

Change in the plastids of potato tubers under the influence of  
many days of light. Vestsi AN BSSR Ser. biial. nav. no.3:74-80  
'64 (MIRA 18:1)

CHAYKA, N.

PA 51/49T87

USSR/Radio  
Radiofication

Jul 49

"How We Radiofied Our Rayon," N. Chayka, Secy,  
Poltavka Rayon Committee, VLKSM, Omsk Oblast,  
2 pp

"Radio" No 7

Since Nov 48, all 52 kolkhozes of Poltavka Rayon  
have been radiofied; 4,500 crystal sets and 230  
radios have been installed in villages; seven  
kolkhozes were radiofied from receiving-PA units.  
Young Communist League members were primarily  
responsible for this work.

51/49T87

BOBOREKO, E.A.; KALYUZHNYI, M.Ya.; CHAYKA, N.D.; ABRAMOVICH, M.M.; SHILOV, Yu.P.;  
DRUZHININA, A.T.; ZYBIN, S.Ye. [deceased]; BATIKOV, L.S.

Improving the process of yeast growing on wood hydrolyzates.  
Gidroliz. i lesokhim.prom. 17 no.8:22-25 '64.

(MIRA 18:1)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut gidroliznoy  
i sul'fitno-spirovoy promyshlennosti, Leningrad (for Boboreko,  
Kalyuznyy, Chayka, Abramovich). 2. Ivdel'skiy gidroliznyy zavod  
(for Shilov, Drushinina, Zybin, Batikov).

~~CHAYKA, P.I.~~

First factory school in the sugar industry. Sakh.prom. 37 no.2:  
75(155) F '63. (MIRA 16:5)  
(Vocational education) (Sugar industry)



CHAYKA, N. K.

PA 43/49T42

USSR/Engineering  
Construction Industry  
Bibliography

Jun 48

"Soviet Technical Periodicals" 2 pp

"Stroi Prom" No 6

Reviews technical periodicals, among other: N. K. Chayka's "Production of Tower Cranes for Residential Constructions," I. M. Iog's "Mechanization of Limestone Unloading," D. S. Ioffe's "Mobile-Suspension Cableway," etc.

43/49T42

DORONENKO, F.G.; CHAYKO, N.P.

Effect of the rate of mining on the duration of strip mine construction. Trudy Inst.gor.dela AN Kazakh.SSR 14:98-107 '64.  
(MIRA 18:1)

YES'KOV, K.A.; CHAYKA, O.V.

In the Coordinating Council on Welding. Avtom.svar. 15 no.4:94-95  
Ap 1962. (MIRA 15:3)

(Welding—Congresses)

ACC NR: AP6030984 (N) SOURCE CODE: UR/0378/66/000/004/0025/0032

AUTHOR: Matsevityy, L. V.; Chayka, N. S.

ORG: none

TITLE: Coding the states of a sequential device on taking into account certain logic properties of the incorporated elements

SOURCE: Kibernetika, no. 4, 1966, 25-32

TOPIC TAGS: logic design, communication coding, computer coding, coding evaluation

ABSTRACT: The article deals with a method of coding which makes it possible, for a given number of coincidence-element inputs, to find the codes of internal states in such a way as to dispense with the need to construct multistage coincidence. This pertains to a sequential device for which each possible set of values of signals at its input terminals is denoted by a symbol of the alphabet X and each possible set of values of signals at the output terminals is denoted by a symbol of the alphabet Y. Since any device may be considered to consist of two parts of which one represents memory elements and the other the combinational scheme, any possible set of signal values at the input channel of any memory element will be denoted by a

Card 1/2

UDC: 681.142.1.01

ACC NR: AP6030984

symbol of the alphabet U and any possible set of signal values at the output channel of any memory element will be denoted by a symbol of the alphabet V. At such a notation each pair of symbols of the alphabets X and V corresponds to a pair of symbols of the alphabets U and Y. A particular case of binary memory elements is considered for which a symbol of the alphabet V at any time instant is uniquely determined by the set of states of these elements, a set which, on ordering, will be termed a code. Each symbol of the alphabet V uniquely corresponds to a code and in the general case for m memory elements the establishment of this correspondence requires examining the entire code of length m. Coincidence-realizing logic elements have a limited number g of input channels, which often is smaller than  $m + p$  (where p is the number of channels used to code a symbol of the alphabet X). Therefore, it is of interest to develop such a coding of states as would result in assigning to each state a specific code segment with a length of not more than  $n < m$ , which differs from the same code segment of any other state, and where n is chosen so that the sum of  $n + p$  would not exceed g. It is shown that this can be accomplished by subdividing the set of N states into disjoint subsets of  $2^{n-1}$  states each. Suppose  $N = s(2^{n-1}) + q$ , where  $q < (2^{n-1})$ . Thus, we have s subsets of  $2^{n-1}$  states each and one subset of q states. We code the states of one of the subsets by means of the sets of values of n variables and the single remaining set will correspond to all the sets not entering in the selected subset. The sets of values of n variables represent the first segment of the code of all states. This operation is repeated until the code segment of each state are determined, and a pertinent coding algorithm is described.

SUB CODE: 09, 12, 06/ SUBM DATE: 17Jul65/ ORIG REF: 004/ OTH REF: 004

Card 2/2

FRUMIN, I.I.; CHAYKA, O.V.

In the Coordinating Council on Welding. Avtom. svar. 15 no.8:93-95  
Ag '62. (MIRA 15:7)

(Welding research)

CHAYKA, P.A.

Use of the universal "TISS" radiometer for the fluorometric  
determination of coproporphyrin. Lab. delo no. 12:719-723 '64.  
(MIRA 18:1)

1. Kafedra obshchey gigiyeny (Zaveduyushchiy - doktor med.nauk  
prof. P.I.Barannik) Kiyevskogo meditsinskogo instituta.

CHAYKA, T.P.

Chemical composition of commercial natural honey. Vop. pit.  
20 no.6:75-76 N-D '61. (MIRA 15:6)

1. Iz Yaltinskoy gorodskoy sanitarno-epidemiologicheskoy  
stantsii.

(HONEY)



CHAYKA, T.P.

Vitamin C activity in commercial vegetable products. Vop.pit.  
22 no.1:91-92 Ja-F'63 (MIRA 16:11)

1. Iz sanitarno-epidemiologicheskoy stantsii, Yalta.

\*

CHAYKA, T. and ANICHKOV, N. N.

Ueber die Verteilung und die Ablagerungsorte der Tusche nach subkutanen und intraperitonealen Einführung. Zeitschr. für die gesamte experimentelle Medizin. 92, 3/4, 497-516, 1933.

1ST AND 2ND DIGITS																										PROCESS AND PROPERTIES INDEX																									
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26																										1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26																									
CHAYKA, T.V.																																																			
CA																										11F																									
<p><b>Effect of antithyroidine on the development of experimental lipidosis in rats.</b> T. V. Chayka, <i>Arch. sci. biol.</i> (U. S. S. R.) 57, No. 1, 29-34 (in English, 34) (1940).—The feeding of cholesterol, with an addn. of antithyroidine (a nonstandardized prepn. from the serum of thyroidectomized rats), induces in rats a higher hypercholesterolemia (up to 192 mg. %) than prolonged feeding of cholesterol alone (av. 91 mg. %). The metabolism and the function of the thyroid gland are lowered. No deposition of lipoids in the walls of the aorta occurs.</p> <p><b>Experimental lipidosis in rats.</b> <i>Ibid.</i> Nos. 23, 74-81 (1940).—Daily doses of 3 cc. of a 5% soln. of cholesterol in oil, given in mixt. with lactic acid for 2-6 months caused an accumulation of lipoids mainly in the liver and in the adrenal cortex. Another group of rats received oleic acid in addn. to the above mixt. This caused the lipoids to disappear from the organs mentioned in 3-4 months, while the cholesterol level of the blood serum had increased from 87 mg. % to 96 mg. %. Neither treatment caused deposition of lipoids in aortal walls. The absorption of lipoids by reticulo-endothelial cells was higher in the 2nd series.</p> <p style="text-align: right;">T. Laanes</p>																																																			
METALLURGICAL LITERATURE CLASSIFICATION																																																			

CHAYKA, T.V., dotsent.

Changes in the oral mucosa in dysentery. Stomatologiya no.5:8-11  
'53. (MLRA 7:1)

1. Iz kafedry patologicheskoy anatomii (zaveduyushchiy - professor  
L.V.Sipovskiy) Leningradskogo meditsinskogo stomatologicheskogo  
instituta (direktor - professor R.I.Gavrilov).  
(Mouth) (Dysentery) (Mucous membrane)

CHAYKA, T. V., Doc Med Sci -- (diss) "Experimental and pathologico-anatomic studies on the morphology of alimentary exhaustion." Len, 1957. 24 pp (1st Len Med Inst im Academician I. P. Pavlov), 200 copies (KL, 2-58, 115)

SHAMOV, V.N.; BABCHIN, I.S.; BADMAYEV, K.N.; CHAYKA, T.V.; MANDEL'BOYM, A.B.;  
NEYMAN, B.G. (Leningrad)

Some observations on radiogold therapy in inoperable cerebral  
tumors. Vop.neirokhir. 23 no.3:1-6 My-Je '59. (MIRA 12:8)

1. Nauchno-issledovatel'skiy neyrokhirurgicheskiy institut  
imeni prof.A.L.Polenova.

(BRAIN NEOPLASMS, ther.

radiogold in inoperable tumors (Rus))

(GOLD, radioactive,

ther. of cancer of brain, inoperable cases  
(Rus))

MYUL'BERG, A.A.; SYTINSKIY, I.A.; CHAYKA, T.V.

Electrophoretic separation of soluble proteins in tumors of the human brain. Vop.med.khim. 8 no.1:58-64 Ja-F '62. (MIRA 15:11)

1. Laboratoriya khimii belka Leningradskogo gosudarstvennogo universiteta imeni A.A.Zhdanova, i patologoanatomicheskaya laboratoriya Instituta neyrokhirurgii imeni A.L.Polenova, Leningrad.

(BRAIN--TUMORS)

(PROTEINS)

(ELECTROPHORESIS)

PEVZNER, L.Z.; TOMINE, Ye.D.; CHAYKA, T.V.

Cytospectrophotometric research on the DNA content of human  
brain tumor cells. Vop. med. khim. 10 no.4:379-386 J1-Ag '64.  
(MIRA 18:4)

1. Laboratoriya khimii belka Fiziologicheskogo instituta imeni  
A.A.Ukhtomskogo Leningrad i laboratoriya patologicheskoy anatomii  
Nauchno-issledovatel'skogo neyrokhirurgicheskogo instituta  
Imeni Popenova, Leningrad.



CHAYKA, V.

Adjustment of interchangeable lenses. Sov.foto 21 no.12:28-29 D  
'61. (MIRA 14:12)

(Cameras)

ACCESSION NR: AP4039602

S/0126/64/017/005/0737/0743

AUTHORS: Aksenov, G. I.; Morozov, N. P.; Chayka, V. A.

TITLE: Investigations of the terminal structural deformations and residual austenite quantity in quenched rolled steel

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 5, 1964, 737-743

TOPIC TAGS: rolled steel, martensite, structural deformation, residual austenite, annealing, quenching medium, steel 9Kh

ABSTRACT: The effect of heating and cooling (in the martensite temperature range) on the magnitude of relative structural deformation and on the quantity of residual austenite in quenched rolled 9Kh steels was studied. The specimens were 30 mm long, 4 mm in diameter, and contained 0.88% C and 1.52% Cr. Four sets of experiments were performed. In all of them the initial temperature of the specimen was 850-900C, but cooling was carried out at different rates by using an oil bath at various temperatures. Theoretical predictions for relative quenching deformations gave values 3 to 6 times higher than those measured experimentally ( $\epsilon_{\text{th}} = 9$  to  $10 \times 10^{-4}$ ). Analysis indicates that this discrepancy is caused primarily by the

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ACCESSION NR: AP4039602

presence of residual austenite (of the order  $10 \times 10^{-4}$  to  $15 \times 10^{-4}$ ) which is responsible for an incomplete solution of carbon in austenite. Only an amount equal to  $10^{-4}$  to  $5 \times 10^{-4}$  is due to pure martensite decay during cooling from  $M_N$  to 80-90C temperatures. The lowest structural deformation within the scope of these experiments was observed during stepwise quenching (in the presence of increased self-annealing processes and of a certain amount of residual austenites). Orig. art. has: 3 formulas and 2 figures.

ASSOCIATION: Kuyby\*shevskiy aviatsionnyy institut (Kuybyshev Aviation Institute)

SUBMITTED: 11Mar63

DATE ACQ: 19Jun64

ENCL: 00

SUB CODE: MM

NO REF SOV: 014

OTHER: 000

Card 2/2

ANTONIK, M.T., elektrosvarshchik; CHAYKA, V., redaktor; TRUKHANOVA, A.,  
tekhnicheskiiy redaktor

[Efficient methods in electric welding] Proisvoditel'nye metody v  
elektrosvarke. Minsk, Gos. izd-vo BSSR, 1955. 35 p. (MLRA 10:1)

1. Minskiy traktornyy zavod (for Antonik)  
(Electric welding)

CHAYKA, Y. A.; MEL'NIKOV, G., redaktor; TRUKHANOVA, A., tekhnicheskiy redaktor

[Principles of manual electric welding] Osnovy ruchnoi dugo-  
voi elektrosvarki. Minsk, Gos.izd-vo BSSR, Red. nauchno-tekhn.  
lit-ry, 1955. 93 p. (MIRA 9:3)  
(Electric welding)

CHAYKA, V. A.

CHAYKA, V. A.: "Investigation of the plastic properties of steel in the temperature range close to the melting point, using contact heating". Minsk, 1955. Min Higher Education USSR. Belorussian Polytechnic Inst imeni I. V. Stalin. (Dissertations for the degree of Candidate of Technical Science.)

SO: Knizhnaya Letopis' No. 50 10 December 1955. Moscow.

25(1)

PHASE I BOOK EXPLOITATION

SOV/3359

Chayka, V.A.

Osnovy kontaktnoy svarki i elektronagreva (Fundamentals of Resistance Welding and Electric Heating) Minsk, Gos. izd-vo BSSR, 1958. 76 p. (Series: Bibliotekha rabochego mashinostroitel'ya). 3,000 copies printed.

Ed.: F. Kashtanov; Tech. Ed.: N. Stepanova.

PURPOSE: This booklet is intended for welders working with electric resistance welding machinery.

COVERAGE: The author discusses the principles of electric resistance welding and electric heating. The technique and particularities of various types of resistance welding are described. Welding equipment and adjustments are outlined. Descriptions are illustrated with drawings and tables. Safety rules to be followed in welding jobs are provided. No personalities are mentioned. There are 6 references, all Soviet.

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TITLE: Compilation of composite seismic maps of the southeastern part of the Dnepr-Donets basin

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ABSTRACT: A second interpretation is made of seismic data obtained for the southeastern part of the Dnepr-Donets basin, using supplementary data obtained in drillings. Structural maps to the scale of 1:50,000 and 1:100,000 are plotted for four horizons, from the Cenomanian to the Lower Permian. Iso-pachous line maps, plotted on the basis of data obtained in seismic exploration, are also discussed. A detailed analysis is made of the tectonic structure of the Upper Paleozoic, Mesozoic, and Cenozoic stages on the basis of the above-mentioned

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